

33. A method of claim 32, wherein the viscosity of aqueous glittering ink measured by an ELD-type viscometer (3° R14 cone; rotation speed: 0.5 rpm; 20°C) is 1000 to 10000 rpm.

34. A method for using an aqueous glittering ink composition for a writing tool, the method comprising: providing an aqueous glittering ink composition which comprises a glass flake pigment coated with a metal having a median diameter of about 5 to about 100 µm, a water-soluble resin, a water-soluble organic solvent and water, packing said aqueous glittering ink composition into an ink container made of a hollow tube, and equipping a ball-point pen tip with said ink container.

35. A method of claim 34, wherein the viscosity of aqueous glittering ink measured by an ELD-type viscometer (3° R14 cone; rotation speed: 0.5 rpm; 20°C) is 1000 to 10000 rpm.

#### **REMARKS**

Applicants' counsel acknowledges and thanks the Examiner for the courtesy of a personal interview on January 11, 2002.

Applicants are preparing a divisional application directed to the subject matter of pending independent claims 2 and 4 and dependent claims 6, 8, 10, 12, and 14 and anticipate filing it by February 1, 2002. On filing this divisional application, those claims would be withdrawn from this application.

Therefore, Applicants request that further consideration of claims, 2, 4, 6, 8, 10, 12 and 14 be stayed.

Consequently, the rejection of those claims has not been argued in this paper.

**THE OFFICE ACTION**

In the Official Action dated July 12, 2001, the Examiner:

1. Rejected the following claims as being anticipated under 35 U.S.C. §102 by the following respective references:

- |                              |                                   |
|------------------------------|-----------------------------------|
| a. 2, 4, 6, 8, 10, 12 and 14 | Japanese Patent No. 10077438;     |
| b. 2, 6, 8 and 10            | Japanese Patent No. 7118592; and, |
| c. 2, 4, 6, 8, 10 and 14     | European Patent 600205.           |

As a result of the filing of a divisional application directed to these claims (claims 2, 4, 6, 8, 10, 12 and 14), the rejection of these claims should be held in abeyance

23. Rejected the following claims as being obvious under 35 U.S.C. §103 over the following respective references:

- |                                    |  |
|------------------------------------|--|
| a. 14 and 21                       | Japanese Patent Nos. 10077438 or 7118592,<br>or European Patent 600205,<br>in view of Okuda, et al. (U.S. Patent 5,510,397);                               |
| b. 1, 5, 7 and 9                   | Japanese Patent No. 7118592<br>in view of either Babler (U.S. Patent 5,554,217),<br>Sullivan (U.S. Patent 5,753,371) or Yolles<br>(U.S. Patent 3,053,683); |
| c. 1, 3, 5, 7, 9, 11, 15-18 and 20 | Kubota et al. (U.S. Patent 6,039,796),<br>in view of Babler (U.S. Patent 6,063,182),<br>or Yolles (U.S. Patent 3,053,683);                                 |

d. 13 and 21

Kubota et al. (U.S. Patent 6,039,796).  
in view of Babler (U.S. Patent 6,063,182).  
or Yolles (U.S. Patent 3,053,683).  
in further view of Whymuzis (U.S. Patent  
5,714,526); and.

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Kubota et al. (U.S. Patent 6,039,796).  
in view of Babler (U.S. Patent 6,063,182).  
or Yolles (U.S. Patent 3,053,683).  
in further view of Morita et al. (U.S. Patent  
6,099,629).

### **THE CLAIMED INVENTION**

The present invention relates to an aqueous glittering writing pen ink composition. The claimed invention of the present application relates to an aqueous glittering writing pen ink composition that has a glittering feeling, i.e., that glitters. The inks of the present invention provide a writing that has a strong glittering appearance and a 3-dimensional, or spatial, effect when they are viewed.

Applicants have discovered that this glittering feeling is provided by a glass flake pigment that is glass flake coated with metal.

New claims 22 through 31 are directed to a writing tool incorporating the aqueous glittering ink composition of the present invention and claims 32 through 35 are directed to methods of using the aqueous glittering ink composition of the present invention.

## **RESPONSE TO THE REJECTIONS**

### **Japanese Patent No. 10074438 ("JP 10074438")**

JP10074438 is an ink capable of obtaining a written mark with a metallic color (metallic tone) including gold, silver, or the like. JP10074438 discloses that the "pearlescent pigment" is contained as a colorant to obtain a metallic color including gold, silver, or the like. And the said pearlescent pigment is a mica coated with titanium oxide or iron oxide. When incident light enters on the particle surface of pearlescent pigments, since the pigment surface is a metallic oxide coating layer (not a metal coating layer), most of the light permeates and refracts itself in this metallic oxide coating layer. Further, the light permeates and refracts itself in the mica layer, too. As a result, within the particles, a slightly reflected light with different wave length generated by the refraction within the particles shows an interference color, thereby providing pearlescent color.

On the other hand, in the aluminum pastes described JP1004438, since the surface of these aluminum pigment particles is a metallic surface, unlike the previously described pearlescent pigments, the incident light does not permeate and refracts itself in the particles. However, the incident light shows diffused reflection without metallic reflection (without specular reflection). Therefore, it only develops its color with the silver wave length which the aluminum material inherently has rather than the glittering feeling with a glitter.

Since the ink of the present invention comprises glass flake coated with metal, the incident light reflects on the surface of the said flake particles as a metal reflection, and a writing having a glittering feeling with a strong glitter is obtained. An ink that can produce such a writing is not taught in JP10077438.

### **Japanese Patent No. 7118592 ("JP7118592")**

Like JP10074438, JP7118592 discloses an ink in which a "pearlescent pigment" is contained as a colorant to obtain a written mark with a metallic color including gold, silver, or the like. The "pearlescent pigment" is a mica coated with titanium oxide or iron oxide. Therefore, the ink of JP7118592 which contains a pearlescent pigment cannot provide a written mark with a glittering feeling although it can provide a written mark with a metallic color.

In regard to the aluminum powder described in JP7118592, as in JP10077438, the incident light does not permeate and refracts itself in these aluminum pigment particles. However, the incident light shows diffused reflection without metallic reflection (without specular reflection). Therefore, it only develops its color with the silver wave length which the aluminum material inherently has rather than the glittering feeling with a glitter. Therefore, for example, the ink in the Comparative Example 3 in page 4 of JP7118592 is defined as a "silver ink", and when this ink is written on a paper surface, according to the description, a written mark with a silver color was provided (JP7118592 Page 4, column 6, lines 29 to 32).

Since the ink composition of the present invention comprises glass flake coated with metal, the incident light shows metallic reflection on the said flake particles, thereby capable of producing a writing with a strong glittering feeling with a glitter.

Therefore, JP7118592 does not teach a glittering ink.

#### **European Patent No. 600205 ("EP 600205")**

Like JP1007438 and JP7118592, the ink of EP600205 is "a pearlescent pigment" comprising mica coated with titanium oxide or iron oxide and it is not glass flake coated with metal.

Therefore, like JP10074438 and JP7118592, although the ink of EP600205 that comprises a pearlescent pigment can provide a written mark with a pearlescent tone, the ink of EP600205 cannot provide a written mark with a glittering feeling as in claims 1 and 3.

Therefore, EP600205 does not disclose the ink of claims 1 and 3.

#### **Babler (U.S. 5,554,217) and Sullivan (U.S. 5,753,371)**

The ink composition of claims 1,3,5,7,9,11,13, and 15-35 comprise glass flakes coated with metal. The said flake is, however, not a simple "glass flake" but a glass flake coated with metal.

On the other hand, Babler et al (US5554217) discloses a glass flake. However, since in a glass flake coated with metal of the present invention, the metal is coated on the smooth surface of the glass flake, the writing of the ink shows metallic reflection, and discloses a glittering

feeling with a strong glitter and a three dimensional or spatial effect. On the other hand, the glass flake of Babler et al (US5554217) is used for realizing a pearlescent color tone in the writing of the ink and it differs from the glass flake coated with metal of the present invention. Since the pearlescent color is a color tone obtained when incident light permeates, refracts itself, and is scattered, even though it can provide a pearlescent color tone on the whole written mark, it cannot provide the effect of a glittering feeling and a spatial effect with a glitter in the writing as shown in the glass flakes coated with metal contained in the ink of the present invention by a metallic reflection of the incident light on the metal surface coated on the smooth glass surface. The effect of Babler et al (US5554217) is the interference effect of the light achieved only when incident light permeates through the coated film and refracts itself. On the other hand, since a glass flake of the present invention is a glass flake coated with a metal, the incident light shows a metallic reflection on the metal surface. Therefore, it does not permeate a metal coated film. In the glass flake coated with metal of the present invention, a smooth metallic surface is realized on the flake surface with the metal coated on the smooth surface of a glass flake, providing a glitter. Therefore, even when Babler et al. (US5554217) is combined with another citation, the ink of the present invention cannot be produced.

The same logic as Babler et al. (US5554217) applies to Sullivan (US5753371). That is, Sullivan (US5753371) states a glass flake coated with metallic oxide. However, since this glass flake is coated with metallic oxide, when incident light enters on a coated film of metallic oxide, unlike in the case of a metallic film, the incident light permeates and refracts itself, which does not have the effect of a metallic reflection with a strong glitter in a written mark as shown in the metal coated glass flake contained in the ink of the present invention showing a metallic reflection of the incident light on the metal surface which is coated on a smooth glass surface. Therefore, even though the glass flake coated with metallic oxide of Sullivan (US5753371) can provide a written mark with a pearlescent color, it cannot provide a glittering feeling with a strong glitter. Therefore, even when Sullivan (US5753371) is combined with another citation, the ink of the present invention cannot be produced.

**Yolles (U.S. 3,053,683)**

Yolles (US 3053683) "relates to novel shiny pigments having particular utility in the production of coating compositions which yield glittery finishes, i.e. surface coatings which sparkle with discrete beams of reflected light." (Column 1, lines 10-13.) "The glittery-finish coating compositions of ... [Yolles] are made by dispersing a thus-prepared shiny pigment in a film-forming material, optionally in the presence or absence of conventional components of coating compositions." (Column 1, 41-45.) The Yolles reference teaches away from that taught and claimed in the present application.

Webster's Third New International Dictionary(unabridged) (1971) defines "coat" (as in coating) at page 433 as follows:

Coat...4: a layer of any substance covering another as a: a cover or lining esp. of an animal organ: MEMBRANE: HUSK, BARK  
<the ~ of the eyeball> <the ~s of an onion> b: a layer of a protective or ornamental substance (as paint or plaster) laid on in a single application <three ~s of paint on the wall>

Coat... 1: to cover or dress with a coat or outer garment 2: to cover or spread with a finishing, protecting, or enclosing layer of any substance <~ a surface with paraffin> <frost ~s the window>  
< ~ glass with silver to make a mirror>

Using the commonly understood meaning of the teachings of the Yolles reference, it is not obvious to take a pigment intended for use in a coating and use it in the nonanalogous environment of an ink that must flow freely and consistently through the fluid channels and tolerances of a writing pen. The Examiner is using applicants' own teaching to convert a non-analogous patent as a reference.

Yolles discloses a pigment that is disclosed to be used in a coating composition. Yolles does not teach, suggest, or motivate one to use that pigment in an ink composition: certainly not in a writing pen ink composition. The Yolles teaching can not be used as an ink composition in a writing pen.

**Kubota (U.S. 6,039,796) and Babler (U.S. 6,063,182)**

US6039796 (Kubota et al) does not disclose a glass flake coated with metal. In addition, US6063182 (Babler) does not disclose a glass flake coated with metal, either. The glass flake coated with metal of the ink of the present invention is so constructed as to glitter by a metallic reflection of an incident light by coating a metal on the smooth surface of the glass flake and it is totally different from the simple glass flake disclosed by US6063182 (Babler).

**Morita (U.S. 6,099,629) and Whyzmusis (U.S. 5,714,526)**

US6099629 (Morita) is cited to disclose a resin emulsion whose lowest film forming temperature is less than 5 °C. US6099629 (Morita) does not teach a finding that a resin emulsion is preferable as a binder for glass flake coated with metal.

Even though US5714526 (Whyzmusis) discloses an opacifying pigment, since none of US6039796 (Kubota), US6063182 (Babler), or US3053683 (Yolles) discloses or indicates a writing pen ink that comprises a glass flake coated with metal ink composition, even though all of these are combined together, those skilled in the art cannot produce a writing pen ink of claims 1, 3, 5, 7, 9, 11, 13 and 15-35.

**Okuda (U.S. 5,510,397)**

Okuda (U.S. 5,510,397) has been applied only for the use of an opacifying pigment, a dependent claim concept. It does not address or resolve the deficiencies of the foregoing citations, particularly in view of the amendment to claim 21 to depend it from claim 1.

**SUMMARY**

The difference between a writing of pearly color or a written mark with metallic color, including gold, silver, or the like on the one hand and a written mark of a glittering feeling with a glitter on the other hand lies in the character of the pigment particles producing them.

A pearlescent pigment has a structure in which an oxidized metal (not a metal) including titanium oxide and the like is coated on a surface such as a mica particle. Therefore, when an incident light enters on the surface of this particle, since the surface of a pigment particle is a coating layer of metallic oxide (not a metallic coating layer), most of the light permeates in this coating layer of metallic oxide, refracts itself, further separating into the light reflecting on the surface of a mica layer and the light which permeates in the mica layer, refracts itself, and reflects. As a result, a pearlescent color appears as one of the interference effect of the light having a different wave length. Therefore, by compounding this mica with metallic oxide into an ink, the written mark becomes a written mark having a pearlescent color, and when other coloring pigments are compounded, a pearlescent color appears as a mixed color.

On the other hand, with respect to an aluminum powder as described in JP7118592, and an aluminum paste as described in JP10077438, since these aluminum pigment particles have a metallic surface, unlike the said pearlescent pigments, the incident light does not permeate in the particle and refracts itself. However, since the surface of aluminum particles is not smooth, the incident light reflects diffusedly without showing any metallic reflection (without specular reflection). Therefore, rather than a glittering feeling with a glitter, it merely develops its color with the silver wave length which the aluminum material originally has. This is not a written mark which has a glittering feeling with a glitter.

Since in the glass flake coated with metal contained in the writing pen ink of the present invention, a metal is coated on a smooth surface of a glass flake, the incident light shows a metallic reflection (specular reflection) on the said flake particles and a written mark with a glittering feeling with a glitter and a spatial effect is produced.

Since claim 1 has been amended to recite glass flake coated with metal, it has now become clear that the writing pen ink of the present invention is patentably distinct from the ink of Babler et al. which contains a simple glass flake and Sullivan et al. which contains a glass flake coated with metal oxide.

Since the glass flake disclosed by Yolles is a composition for coating in order to produce a protective resin layer with glittering finishes, as already stated in detail, Yolles does not disclose or teach or motivate the ink of claim 1 of the present application which is a writing pen ink that is patentable over Yolles.

ADDITIONAL CLAIM FEE

Enclosed is Check No. 504 in the amount of \$ 588.00 for additional claims 22 through

35.

CONCLUSION

Attached hereto is a marked-up version of the changes made to the claims by the current amendments. The attachment is entitled "Version with Markings to Show Changes Made".

In view of the foregoing amendments and remarks, Applicants submit that pending claims, 1, 3, 5, 7, 9, 11, 13 and 15 35 are in condition for allowance and such action is requested.

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Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. (Amended) An aqueous glittering writing pen ink composition comprising

- a. a glass flake pigment.
- b. a water-soluble resin.
- c. a water-soluble organic solvent, and
- d. water

as essential ingredients.

said glass flake pigment being glass flake coated with a metal, and said glass flake pigment having a median diameter of about 5 to about 100  $\mu\text{m}$ .

3. (Amended). An aqueous glittering writing pen ink composition comprising

- a. a glass flake pigment.
- b. water-soluble resin.
- c. a water-soluble organic solvent.
- d. water, and
- e. a colorant

as essential ingredients.

said glass flake pigment being glass flake coated with a metal, and said glass flake pigment having a median diameter of about 5 to about 100  $\mu\text{m}$

21. (Amended) An aqueous glittering ink composition as set forth in claim 1, further containing an opacifying pigment.